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POPULAR ART-EDUCATION.

THE number of persons now engaged in various occupations requiring some knowledge of the principles of art, or of taste, is very large and rapidly increasing. Not only in the manifold forms of fine art, as in painting, sculpture, architectures, illustrative art, and the various processes of etching and engraving, but in what is classed as ornamental or decorative art as applied to handicraft and manufactures, a marked interest, amounting to eagerness, is everywhere manifest in art-instruction, and in art-production. Indeed, there is no field in which commercial competition is more active, at the present time, than in that of ornamental design. In England, France, and America, this activity is most marked, and is rapidly affecting all kinds of manufactures that are capable of being improved by tasteful design. While Art, therefore, in its finer forms, has its recognized place as contributive to the higher interests of civilization, in its lower forms and applications, that are quite within the scope of ordinary talents, it has, perhaps, a more appreciable value in the scheme of popular education, as the wealth and commercial industry of nations have, in several instances, been largely due to their art-products, or to the taste that influenced design in manufactures.

The subject of Art-education may be viewed in two distinct lights: it may be regarded æsthetically or practically. Æsthetically considered, that is with reference to Art as the exponent of the beautiful, as manifested in the creations of the artist, decidedly it has no place in the scheme of common-school education. The proper place for this is within the domain of Art-schools. But in its lower phases and practical applications, Art, in a rudimentary form, both with reference to principles and practice, as in drawing, should certainly enter into the curriculum of prescribed studies, and for the following reasons: Many concep-

tions or inventions must first be bodied forth in form through this means. In all the countless inventions and manufactures that form a part, and the larger part, of commercial industry, design is of conspicuous importance, and at some stage of their creation the ideas lying at the root of these inventions and manufactures must have been determined in form on paper. Behind the pattern is the drawing, and behind the drawing is some elementary knowledge of the principles of Art. In all forms of manufactures, consider the nature and order of commercial competition. First, there is competition in meeting or creating a demand, and in controlling the production necessary for this end; then follows a competition in the mechanical excellence of manufactured goods; and, lastly, competition for excellence and beauty of design. What is it that has yielded France, in the past, such wealth in return for the products of her industry? It is, mainly, the taste and beauty of design displayed in all forms of French production—French tapestries, calicoes, carpets, wall-papers, porcelains, glass, bronzes—everything, in short, into the manufacture of which *design* may fill a conspicuous place, or in the production of which *taste* is a requisite.

At the first great International Exhibition in London, in 1851, the English became aware of this fact, and were then made conscious of the entire absence of taste in design in their own manufactures. The result was the establishment of Art-training schools throughout the Kingdom,—the chief of which is the “South Kensington,” in London,—which have changed the character of English manufactures wherever beauty of design is a requisite of success. Such an entire revolution have these schools effected in ornamental design that, in some respects, the English now excel other nations in the beauty of certain kinds of manufacture. Where they were far behind they are now in advance, and this has been the occasion of new stimulus and new effort on the part of the French, that has led them to take similar steps for furnishing popular Art-instruction, which may enable them to regain and maintain their former supremacy. To mention a single instance, though not the most important, English wall-papers have now a more extensive market than the French, and a large proportion of our own productions of this kind, including all that have merit for design,—unless Mr. Colman and Mr. Tiffany have already brought out their proposed designs,—are the stolen copies of English patterns.

That some idea may be formed of the extent of this movement in England, in the direction of Art-education, the following statistics are offered: The schools of Art established in the United Kingdom, according to last year's report, numbered 147, with an attendance of above 29,000 pupils. The number of schools wherein drawing is taught was 4170, an increase of 403 on the previous year. The number of pupils receiving instruction in drawing and design was, in 1878, 727,874, an increase of more than a hundred thousand over the report of the previous year. At the examinations of 48 "training-colleges," in which teachers of elementary schools obtain certificates as teachers of drawing, 880 persons received these certificates. The last report of the "Art Department of the Committee of Council on Education" says: "In the four years from 1874 to '78, the number of institutions in which instruction is given in drawing, or in higher art, with the aid of the Department, and subject to its inspection, has increased from 3202 to 5238. The number of persons taught, and of exercises and works examined, has more than doubled during the same period, while the total amount of the aid given by the Department in the form of payments on the results of this instruction, as tested by examinations, has risen from £33,921 in 1874, to £51,082 in 1878, or upward of fifty per cent. of increase." These "payments on results of examinations," I may explain, are special fees, varying from a few shillings to a pound or two, paid, *per capita*, on account of pupils whose work has been approved in the examinations of the various training-schools. The sums appropriated last year, for establishing and maintaining schools and museums of art, amounted to more than a million of dollars, and the investment was thought to be a profitable one for the state.

These statistics furnish some indication of the importance this eminently practical people, the English, attach to the subject of Art-instruction. And I cite them, in detail, as more convincing to American minds than would be the higher claims of Art which rest upon more exclusive and subtile grounds. To claim for Art, in education, an elevating and refining influence, exercising the higher faculties of mind, would have, perhaps, for many, far less significance than proving it to be a source of commercial industry and wealth, which leads so-called "practical people" to value it accordingly. The English are not a sentimental people. These statistics cited are not the result of fanciful ideas, or vagaries,

nor of the ignorance that relegates drawing in the schools to the sphere of mere "accomplishment." They are, rather, the result of a hardheaded sense of the value and importance of drawing and design as a source of national benefit and wealth. One of their reports says: "The teaching of drawing is encouraged by the school boards, who appear to appreciate its great value as a training for the eye and hand in view of those manual operations which handicraftsmen have to perform." This, indeed, is rather too "practical" a view to take of it, but it is the one that the average school board will perhaps be most likely to appreciate. It requires at least some elemental knowledge of Art, of its aims and methods, to "see the thing as in itself it really is," to recognize that all its processes, no less than its aims and end, are intellectual, enlisting the higher faculties at every step. The effects of Art, as of all that is truly poetic, are emotional; but its processes for the accomplishment of this end are intellectual.

To return to the utilitarian estimate: consider the numbers of instances, the many occupations, in which ornamental design is a requisite, or where taste is exercised with marked effect,—objects of all kinds that surround one in the home, in vehicles of travel, in structures for domestic, civic, or religious purposes. The absence of taste in the manufacture of articles that otherwise exhibit excellence is often the occasion for condemning them altogether. Taste is the exercise of artistic judgment in the fitness of things with reference to design, and in determining what is ornamentally appropriate. A thing that is ornamented merely for the sake of ornament is in bad taste. Good taste is always economical. It is exercised in determining just how little ornament will suffice to exhibit the form to the best advantage; and, then again, how this little shall be of the finest or most beautiful design. Beauty of design as well as perfection of workmanship is what chiefly builds up a great business like that of Tiffany and Company, who, as jewelers and silversmiths, are said to excel all others, having, by means of the artistic quality of their work, secured the market of the world for their manufactures. Some of our manufacturers of silks and tapestries have competed successfully with even the better class of foreign productions; but in all these cases you will observe that they import their designers, trained for the most part in the schools of France or England, and they pay these designers larger salaries than

our presidents of colleges receive. There are designers for upholsterers in the metropolis who receive salaries greater than those of the members of the cabinet at Washington, and these large salaries are paid simply because it is discovered that the main success of the business depends upon the taste displayed in designing their work.

But this is sufficient to suggest of design that it has "commercial value." Let us now consider, briefly, the value of drawing in the nature of equipment for the ordinary demands of life. In professional or business experience there are thousands of objects that may be recorded in the note-book by a slight sketch, that would require much time to describe in words, and then but vaguely or imperfectly. Drawing may be regarded as of almost equal value, in many kinds of business, with writing. In the absence or ignorance of this faculty to record on paper the image of that which the eye sees, no proper estimate can be formed of its usefulness. Imagine one whose mind is occupied with some invention, but lacking the power to place this upon paper he is under the necessity of seeking some other one who has this power, and to him he must laboriously explain his ideas, that they may be sketched for him. He is in the predicament of one who, desiring to speak, is without a tongue. He probably might exclaim: "What would I not give had I been taught to draw!" It is the addition of another sense; and how abstract, vague, and visionary are word-descriptions of things compared with placing before the eye their forms and features upon paper, in a sketch. To describe a person or a thing—the character indicated in the features of a countenance, or the details that enter into the structure of a house—would lack the sensible vividness that is presented in a sketch. The mechanic, the artificer, the inventor, or the manufacturer who has no knowledge of drawing is at a disadvantage. He must employ a go-between. He must disclose his ideas laboriously, and lose something in the process. To the carpenter who awaits your direction concerning some simple piece of work, you must relinquish your ideas respecting its detail, you must sacrifice your taste to his crude notions; and this, because he required a defined pattern to work from, and which you were unable to give. And so it is in many instances of much greater importance. I have known more than one scientist engaged in his pursuits lament that he had not the power to make drawings of the

objects of his investigations, but must employ some one else to do this for him.

But, taking another view of the merits of popular Art-instruction, let me inquire what is the aim of a common-school education,—what object has the state in view in furnishing free schools for the people? Certainly, the aim and end of this instruction should be distinct from that of the college or the professional schools. Its legitimate aim is a simple one—to furnish the young with the means of earning a livelihood. By this means it makes of them good citizens, with the requisite knowledge for serving the state. It does not design to fit them for professions. This task, with every other professional interest, properly belongs to the college. There is noticeable a marked confusion of ideas on this point. The end, therefore, of a common-school education is to furnish the youth with the tools education supplies for earning a livelihood. A knowledge of the principles and practice of drawing and design contributes to this end quite as directly as any other study in the curriculum, and as a discipline for the mind it has peculiar value, to which reference will hereafter be made.

It is not many years since that the only occupations open to women, or for which they had preparation, external of the home, were those of the drudge or the needle. By *drudgery* I mean employment that does not enlist the interest of the one who labors, and which is undertaken merely for the support of physical existence. Now, however, there are innumerable avenues of tasteful industry by which labor is made more sweet, and more healthful, because the faculties and tastes are exercised in their pursuit. By all forms of illustrative and decorative art, now open to women, they are enabled to achieve an independence—a means of resisting the stings of poverty—that is a very direct blessing to a large class.

If, however, we simply take the ground that instruction in the elements and rudiments of Art educates and disciplines the faculties and senses of the pupil, we are thus enabled to establish its claims to a more prominent place than that usually accorded it in the common-school curriculum. It educates the powers of observation that are at the root of success in all things. It tends to establish that harmony between the head and the hand which is always a subject of admiration in human skill, and which may be so cultivated that the hand becomes, as

it were, an extension of the brain. Art, in its lower forms, is the most practical of intellectual pursuits, because it is the most objective in all its processes. It deals with things as representative of thoughts,—which is the way of nature,—and not in abstract thought as the representative of things. In the processes of Art one employs geometrical ideas in the concrete, and with a vivid sense of their true significance. But ask any pupil of the schools to put in practice, through sensible form, his abstract knowledge of the rules and processes of geometry, and he will likely fail. There is a gulf that still remains unbridged, in our present system of education, between the abstract and the concrete, between the theoretical and the practical. Of what avails the knotty mathematical problems the first boy in the school is able to solve, if his after life affords no opportunity for the exercise of this talent. As a mere discipline, it is very natural, in view of the consecrating effects of custom or tradition, to overestimate the value of such tasks in the common-school system. It would be unwise, certainly, to undervalue them; but I argue from the ground of the requirements of a common-school education. A vast amount of merely abstract knowledge falls away from the mind from disuse, and the time given to its acquisition might have been more profitably employed. The boy on merging into the man, after having completed his round of mental discipline, finds, with some concern at first, that these fine achievements in mental gymnastics slip away quite rapidly from disuse, from finding, in the practical affairs of life, no opportunity for their exercise or application. They pass out of the mind just as surely and completely as the hand forgets its cunning when no longer exercised ingeniously; and when it does fall away, the residuum, in the form of discipline, amounts to little. The respectability of long-continued custom consecrates, in many instances, old forms of discipline that are practically useless. The competition in the school is quite a distinct thing from the competition life affords in its endless activities. The boy who stands at the head of his class is not infrequently the last in the race of life. “Brilliant graduates,” says a recent writer, “seldom become influential and useful men, for the reason that they blindly insist upon substituting scholastic attainment for honest sense.” Abstract methods of educating the faculties, while they exercise the memory and plume the wits, do not, somehow, further that mental grasp

which should lay hold, tenaciously, upon the practical affairs of life in common experience. They are apt to substitute an image, a shadow, for the substance. When we see the brilliant performance, the many appliances with which the student is now surrounded, the seemingly perfected systems covering extensive fields of learning, we wonder, oftentimes, at the poverty of their results. The youth enters upon his tasks with the idea that these things have arrived at perfection; that the means and appliances which surround him, the teachers who guide and instruct him, and the rewards that await his present triumphs, are all adequate and perfect in every particular. But later on, when these are left behind, and he regards them from the stand-point of the father placing his son at school, he becomes critical. He sees their imperfections, and he knows that he himself has been deceived in many respects in the estimate placed upon them. And yet so powerful is custom, or tradition, that he suppresses his convictions, and tries to deceive himself with the belief that it must be all right. The perfection of all this machinery of appliance avails far less in education than is usually believed. A single teacher, whose character and experience give weight to his or her instructions, and who understands the constitution of the mind of the human being under manipulation; and understands, likewise, that behind the mind are the propensities, the impulses, the tastes, the passions,—the mainsprings of action,—will often accomplish far higher and better results than the elaborate systems of the school and the college. I declare it to be a fact, that just as the prevalence of mechanical agencies in manufacture has destroyed all personal skill in handicraft—so that the artificer no longer exercises invention or ingenuity in his art, and consequently has himself become a mere machine, laboring without thought—I say, just as this has been a result of the prevalence of mechanical agencies in manufacture, so do these vast educational machines, when divested of personal sympathies and personal impulses, tend to a like result in developing the mind. The absence of personal stimulus and magnetism, and the severance of the subjects taught from their practical applications, may develop powers of mental abstraction; but in common life and common experience this is not always a desirable end. Knowledge of rules and principles avails but little,—is even valueless, in the absence of any faculty for applying these rules and principles to practical

affairs. Vast systems or institutions of erudite instruction may be admirable in their proper place, particularly for forming the minds of teachers or pedagogues; and yet notice, in the school or the college, how eagerly students seek the instruction of those who manifest strong practical sense even in recondite subjects, while they drone listlessly under the pedant or the theorist. But a common-school education has a different and distinct end in view. Is it "all right" when the youth must flounder about in the sea of life for a long season after his first plunge, in ignorance of the application of rules and principles to the practical conditions in which he is merged? And yet it is the common experience that he must do this until he has either forgotten much that he has learned, or until he learns a new system of induction—of evolving sounder principles from practice, which rightly puts the horse before the cart, and enables him to travel the highways of life with the credit due to common sense. These words are not directed against systems and institutions save where the machinery has subverted and supplanted personal needs, sympathies, and impulses in education, and where the teacher stands apart from the pupil as an impersonal agent. When we look back upon the condition of the common people in the Middle Ages, upon their prevalent skill in handicraft, upon their common interest in high thinking and attainment, as manifested in the products of their numerous guilds, we cannot say that we have advanced much in the direction of happiness secured by labor. Those old guilds were admirable educational institutions. See what the goldsmiths' guild alone produced in men of genius, men of wide diversity of talent. Their numerous works testify that their marvelous manual skill was guided by a fine intelligence. The products of their arts were both useful and beautiful, and in their labors they must have secured far greater happiness than falls to the lot of the human being of to-day whose business it is to stand beside a machine from sunrise till sunset, without striking fire of a single thought, without putting into his labor a single idea. When money is the sole end and aim, and the processes by which this is secured are void of interest for the laborer, then indeed is his lot a hard one.

Now, a large proportion of the youth of both sexes attending the common schools and the high schools are the children of mechanics or tradespeople. Let me ask if there is not, in popular education,—when carried too far in certain directions unsuited to

the needs of the class of pupils attending public schools,—a wrong tendency, under false ideas, the effect of which is to render the young restless or scornful of the conditions in which they were born, and for which by nature and circumstance they are properly fitted? These conditions, the sphere of handicraft especially, should be rendered more honorable and more satisfying and happy, by bringing to them a higher intelligence—the educated mind. It is a false pride that is manifested in the restless desire to get above these honorable kinds of labor, to secure a kind of *shoddy* place in what appears to be commonly regarded as more “respectable” occupations. This is abominably false, these estimates. Quentin Matsys working at his anvil, at Antwerp, has left a more honorable name—certainly a more famous one—than have some kings, or innumerable presidents of colleges and corporations. One of the important truths to be impressed on the minds of the young, by education, is that there is equal morality and dignity in all forms of labor that enlist the higher faculties. But when manual labor is of that character which renders the artificer an unthinking machine, and his work a mere physical grind for daily bread, then must this labor merit the slights cast upon it by aspiring youths. It then no longer appeals to the mind and the imagination as a means of exercising the faculties in beautiful and ingenious inventions. A blacksmith recently told me that skill was no longer a requisite in his craft, and consequently it was a lost art. The machine furnishes every needful thing that is made of metal, and the smith but welds the odds and ends, or is occupied with mere journeyman’s work. And it is the same with the carpenter, who no longer has even the tools for working ingeniously in wood. He receives his materials ready formed from the *mill*. He is unable to devise or construct the simplest molding.

The machine has, in some respects, had its day. Its function is to supply to the masses what hitherto the few alone could enjoy. This is its great merit. But now it is discovered that there is a large class of persons whose taste will never accept machine-made things. They require in everything with which they surround themselves some expression of human sensibility and thought. In short, they demand that things shall be beautiful as well as useful. And if we all clearly understood what the word *beautiful* signifies we would, doubtless, be of one mind in this desire—for it is the way of the Creator, “who hath made all

things *beautiful* in His time." That scorn of beauty, which the practical utilitarian prides himself in manifesting, is but a gross form of ignorance. It was only the other day that the Hon. Thomas Hughes, in addressing a large audience at Cincinnati, said: "It is necessary, my friends, if society is to be raised, as we hope that it will be, that there should be a distinct acknowledgment that the cultivation of beauty is a necessity of our times for all the nations. I believe it to be," he said, "a necessity of human life."

This is all pertinent to our subject—Art-education and the teaching of drawing in the public schools. If I make it clear that design enters into the larger part of the occupations of man, from the highest manifestations of fine art to the lower forms of manufacture and handicraft, then unquestionably I prove its usefulness and its title to a prominent place in the scheme of popular education. It should have greater prominence and a more stable place than that accorded it by the timid recognition it now receives. At the tail end of the curriculum it is tacked on as a doubtful appendage, and the time awarded instructors in this branch is but the odds and ends of unfilled moments, altogether inadequate for practical and proper results.

But let us see how far behind the age we are in debating this subject. In France, it was long ago recognized that drawing should be taught in all the schools; and I have indicated how actively and eagerly the English are developing this branch of instruction, and with what vast results. In Germany, a similar activity is manifest. A department of the fine arts has, within a few years past, been engrafted upon the Universities of Oxford, of Cambridge, of London, of Paris, of Yale,—not to mention a large number of colleges of less prominence. The Sheffield Scientific School has for eight years past recognized the fact that even a rudimentary discipline in the elements of free-hand drawing is of value to their students, and they have regularly sent their freshman class to the Yale Art School for this instruction. With these precedents, we may safely infer that drawing has a recognized value in the plan of education adopted by leading nations and leading institutions. It has long since passed its experimental phase abroad, and why should we be slow in recognizing its value here, where, from the very nature of our industries, it is greatly needed in furthering the ends of design in manufactures and in countless occupations that engage the minds and hands of an ingenious and inventive people?

Now let me recapitulate, in brief, the advantages that may be derived from drawing as an educational discipline: It develops and concentrates the powers of observation by imitation; it exercises the analytical and synthetical faculties; it trains the hand, and renders it a skillful instrument of mind; it furnishes a means, only second to that of written or spoken language, for communicating ideas; it gives experimental or definite form to inventions and designs that cannot otherwise be placed before the eye and the mind, except in the more laborious and costly form of physical models; it tends to bridge over the gulf between the theoretical and the practical by compelling a strict subservience to truth in defining natural forms, and by making these forms conform to nature and to common sense under the tests of the sense of sight; it opens to the mind the universe of sensible appearance, to which we are often unconsciously blind; it is a means of livelihood, of intellectual recreation, and it acquaints one more intimately with the wonderful beauty and structure of the world in which we live. As a means of education, therefore, undeniably it has its place, and this should be accorded due prominence. Education, if it means anything, is the quickening of the powers that enable us to live,—ideally and practically, morally and mentally,—or that give us the capacity to enjoy and expand this life; and Art, even in its simplest form, tends to these ends. To bring about the desired results, by giving drawing its proper place in our common schools, the following suggestions may not be out of place: There should be general superintendents of this branch of instruction, whose experience and talents would wisely direct the simplest and best methods of discipline in the elements of design; and under them there should be, in all the schools, teachers who have received certificates from some acknowledged school of art, whose course is extended and thorough. The competition to secure these certificates, which should be limited to the needs of the schools and the state, would insure a high order of accomplishment and skill in those who received them. As it now is, there is little or no proper qualification necessary to secure a place as teacher of drawing, whereas in other studies some thoroughness of training is deemed essential. Then, again, the time allotted to this study should be adequate for attaining useful results. A merely superficial dabbling, at odd intervals, and measured by a few otherwise unoccupied moments, can avail nothing. Lastly, drawing

is not fine art—requiring special talents of an exceptional and rare kind—any more than language is poetry. One of the absurd errors not infrequently met with in ordinary discussions of this subject is the confounding of the draughtsman with the artist. One may be a perfectly skilled draughtsman and yet not be an artist,—as one may have a perfect command of language and not be a poet. The teaching of drawing in the public schools should be exclusively with reference to forming draughtsmen,—to provide the pupils with a knowledge of the grammar of Art and the practice that will enable them to employ this knowledge as a language of sensible forms in the ordinary occupations of life. In whatever occupations a knowledge of form is essential, the value of good draughtsmanship is plainly recognizable.

But, leaving these so-called practical considerations, let me offer a few suggestions with reference to the higher forms of Art-education,—the objects that engage the attention of Art-schools, in professional instruction: What is Art, in a higher sense? In its æsthetic sense, as distinguished from the practical, or utilitarian, it is simply a language of sensible forms, emotional, and designed to awaken pleasurable impressions. Its aim is poetic. Whatever is beautiful or true—for these are but interchangeable terms in Art—has that inherent quality which addresses the intelligence agreeably or happily. This is observed even in instances where the materials employed are of the most painful or tragic character—as in the “*Macbeth*” of Shakespeare, or in a “*Crucifixion*” by Rubens or Rembrandt.

There are various kinds of truths manifest in nature, and the value of these truths, personally and individually, rests upon the order of our sympathies. The anatomist formulates the knowledge of the structure and functions of all parts of the physical system of man, for instance; while the artist, or the dramatist, exhibits to the sense the form, action, and expression of which this system is susceptible under all the varying conditions of life. Harvey explains for us the wonderful phenomenon of the circulation of the blood; while Shakespeare, without this knowledge, but with an equally profound sense of the value of truths of a different order, exhibits to the mind this living organism under all the active impulses of passion and emotion. Art, in imitation of nature, exhibits to us the blush of pride or of shame, the swollen veins of passion, the blanched features of

fear, the livid look of despair—all outward manifestations of that same great fact discovered by Harvey. A knowledge, therefore, of the structure and mechanism of this wonderful creation cannot reasonably be held to be of greater importance than the poetic manifestations of the emotional life it manifests. When, therefore, the artist seeks in nature the truths of form, character, and expression which are the components of the sensible appearance, and conforms to these his own creative impulses, he is occupied with that which is of no less importance—to say the least—than is the scientist who formulates the laws of structural organisms. Art, in the performance, is the exercise of the inventive or formative faculties of mind. It is creative. The artist employs methods of analysis and synthesis that are not exercised to a greater extent in any other study. Without venturing very far on merely metaphysical ground, we may readily see that the higher faculties are exercised and disciplined by the study of Art, and they are, by this means, developed more exactly and more usefully than by merely abstract methods. The great body of human intelligence does not reason from mere abstractions, by logical formulas; but from *things*, from experience of the sensible realities that surround us.

Ignorance of the nature of the disciplines afforded by art-practice may cause one to infer that they are little more than a kind of lawless indulgence of fancy, if, indeed, the other extreme view be not held, that it is but a training of the hand and eye. But the necessity, in Art, of a strict conformity to natural truths forces the mind into those undeviating channels through which alone flows the very essence of truth. The scientist is not more profoundly devoted to the scrutiny of the facts of nature than is the artist. The facts observed and digested by them, however, are scrutinized with distinct ends in view—one inquires for the sake of knowledge, the other for the sake of production.

The disciplines of Art, therefore, develop the higher faculties of mind, and they lift upon a higher plane the emotional experiences. The constant exercise of the inventive faculties in Art, on the basis of close observations of nature, tend to develop these faculties (contrary to purely literary traditions) in an eminently practical way. Science and the useful arts have been frequently indebted to artists for important discoveries and inventions. Without casting the eye beyond the limits of our own time and

country, I may mention Robert Fulton, the inventor of the steam-boat, who was a portrait-painter; Morse, the inventor of the telegraph, who was a distinguished artist and president of the National Academy of Design; and Alvan Clark, of Cambridge, who excels all the world in making telescopic lenses, who was likewise a painter. There are others I might mention, whose inventions and discoveries have been marked, though of less conspicuous value to the advancement of civilization. Here, therefore, within these narrow limits of time and place, without looking abroad or into the remote past, we find conspicuous examples of the effect of accurate and sustained habits of observation—of the trained senses and the trained faculties developed and acting in unison, as exercised in the practice of Art. I might add illustrations from the experience of the great masters in Art,—Michael Angelo, Leonardo da Vinci, and others,—showing the intellectual energy with which they passed from one art to another with a quick intelligence; erecting vast structures of architectural and engineering skill, while at the same time engaged in the employment of artistic skill in poetic creations, in works of a finer art, that have commanded the unstinted praise and homage of mankind. But this may be well understood, and occasion little surprise, if we consider the fact that Art is invention, and that the creative faculties, which are the supreme faculties of mind, are engaged in every true work of art in the invention of forms, even of ideal forms, in imitation of nature and under the guidance of her laws.

JOHN F. WEIR.